Topic: One-sided limits

Question: Find the left-hand limit.

$$\lim_{x \to 2^-} \frac{|x-2|}{x-2}$$

Answer choices:

A -1

B 1

C -2

D 2

© Krista King Math

Solution: A

As we approach $x = 2$ from the left, the function is a constant -1 (the numerator is always positive and the denominator is the same as the numerator except it will always be negative because we are subtracting 2 from values less than 2). Therefore, the limit from the left is -1.

© Krista King Math

Topic: One-sided limits

Question: Find the right-hand limit.

$$\lim_{x \to 2^+} \frac{|x-2|}{x-2}$$

Answer choices:

A -1

B 1

C -2

D 2

© Krista King Math

Solution: B

As we approach $x = 2$ from the right, the function is a constant 1 (the numerator is always positive and the denominator is the same as the numerator and is also always positive because we are subtracting 2 from values greater than 2). Therefore, the limit from the right is 1.

© Krista King Math

Topic: One-sided limits

Question: Find the limit.

$$\lim_{x \to 2} \frac{|x-2|}{x-2}$$

Answer choices:

A -1

B 1

C -2

D Does not exist (DNE)

© Krista King Math

Solution: D

The function approaches -1 from the left and 1 from the right as x approaches 2, and so the limit as x approaches 2 does not exist for this function.

© Krista King Math